

Translation of the pertinent portions of a Notification Regarding the Forwarding of the International Preliminary Report Regarding Patentability in accordance with Rule 71.1 PCT, mailed 06/30/2006

2. This report comprises a total of 8 pages including this cover sheet.

3. Enclosures are also included with the report; these include

A total of 6 pages (*sent to the applicant and to the International Authority*), which include

Pages containing the description, claims and/or drawings that have been amended and upon which this report is based, and/or pages containing corrections approved by the authority (see Rule 70.16 and section 607 of the Administrative Guidelines).

4. This report contains information on the following items:

Field I Basis of the Report

Field V Substantiated determination according to Article 35(2) with respect to novelty, inventive step and industrial applicability; documents and explanations to support this determination

Field I Basis of the Report

1. With respect to **language**, the notification is based upon

The international application in the language in which it was filed.

2. With respect to the **components*** of the international application the report is based upon

Description, pages

2-5, 7-40 in the originally filed version

1, 6 submitted with the application

Claims, No.

1-15 Submitted with the application

Drawings, pages

1/3-3/3 in the originally filed version

Field V. Substantiated Determination under Article 35(2) with respect to novelty, inventive step and industrial applicability; documents and explanations to support this determination

1. Determination

Novelty (N) Yes: Claims 1-15
 No: Claims

Inventive Step (IS) Yes: Claims
 No: Claims 1-15

Industrial Applicability (IA) Yes: Claims 1-15
 No: Claims

2. Documents and Explanations

See attached text

INTERNATIONAL PRELIMINARY REPORT REGARDING PATENTABILITY (ATTACHED TEXT)

Re: Item V.

Reference is made to the following documents:

- D1: US-A-5 546 861 (L+E, UML O+EE FFLER ET AL) 20 August 1996 (08/20/1996)
- D2: DE 199 17 773 A1 (PUDIMAT, ROLAND) 4 November 1999 (11/04/1999)
- D3: EP-A-0 767 059 (GOSS GRAPHIC SYSTEMS, INC) 9 April 1997 (04/09/1997)
- D4: EP-A-1 048 461 (HEIDELBERGER DRUCKMASCHINEN; HEIDELBERGER DRUCKMASCHINEN AKTIENGESELLS) 2 November 2000 (11/02/2000)
- D5: DE 197 24 171 A1 (FPEIFFER, NIKOLAUS, 69118 HEIDELBERG, DE; PUDIMAT, ROLAND, 69412 EBERB) 16 October 1997 (10/16/1997)
- D6: DE 43 02 149 A1 (HEIDELBERGER DRUCKMASCHINEN AG, 69115 HEIDELBERG, DE) 28 July 1994 (07/28/1994)
- D7: DE 198 30 490 A1 (HEIDELBERGER DRUCKMASCHINEN AG, 69115 HEIDELBERG, DE) 20 May 1999 (05/20/1999)
- D8: DE 44 13 735 A1 (HEIDELBERGER DRUCKMASCHINEN AG, 69115 HEIDELBERG, DE; HEIDELBERGER DRU) 26 October 1995 (10/26/1995)
- D9: US-A-4 534 289 (DUERRNAGEL ET AL) 13 August 1985 (08/13/1985)
- D10: EP-A-0 722 831 (BAUMUELLER NUERNBERG GMBH; BAUMUELLER ANLAGEN- SYSTEMTECHNIK GMBH CO) 24 July 1996 (07/24/1996)
- D11: DE 12 41 464 B (AMERICAN TYPE FOUNDERS CO., INC) 1 June 1967 (06/01/1967)
- D12: FR-A-2 391 073 (POLYGRAPH LEIPZIG KOMBINAT POLYG) 15 December 1978 (12/15/1978)
- D13: DE 100 13 876 A1 (HEIDELBERGER DRUCKMASCHINEN AG) 12 October 2000 (10/12/2000)
- D14: DE 100 30 572 A1 (ARADEX AG) 3 January 2002 (01/03/2002)
- D15: GB-A-2 119 505 (BOBST SA) 16 November 1983 (11/16/1983)
- D16: US-A-5 500 801 (LOEFFLER ET AL) 19 March 1996 (03/19/1996)
- D17: EP-A-1 167 035 (TOKYO KIKAI SEISAKUSHO LTD) 2 January 2002 (01/02/2002)
- D18: US-A-5 740 054 (DUERR ET AL) 14 April 1998 (04/14/1998)
- D19: US-A-5 452 632 (DUERR ET AL) 26 September 1995 (09/26/1995)
- D20: EP-A-0 835 755 (HURLETRON, INCORPORATED) 15 April 1998 (04/15/1998)
- D21: US-A-4 847 775 (ROCH ET AL) 11 July 1989 (07/11/1989)
- D22: US 2003/010236 A1 (DE VROOME CLEMENS JOHANNES MARIA) 16 January 2003 (01/16/2003)
- D23: DE 37 30 625 A1 (MASCHINENFABRIK WIFAG; MASCHINENFABRIK WIFAG, BERN, CH) 23 March 1989 (03/23/1989)
- D24: DE 199 10 835 C1 (INNOMESS ELEKTRONIK GMBH) 7 September 2000 (09/07/2000)
- D25: US-B1-6-644 184 (HAJEK JOSEF ET AL) 11 November 2003 (11/11/2003)
- D26: EP-A-0 649 744 (BALDWIN GRAPHIC SYSTEMS, INC) 26 April 1995 (04/26/1995)

1 INDEPENDENT CLAIM 1

- 1.1 The present invention does not fulfill the requirements of Article 33(1) of the PCT, since the object of Claim 1 is not novel as defined by Article 33(2) PCT.
- 1.2 1.2 Document D15 discloses (references in parentheses refer to this document) in Diagram 1:
A printing machine having at least one machine element (12, 41, 43) that can be adjusted with at least one correcting element (40), wherein an adjustment of the at least one machine element (12, 41, 43) affects a quality of a printing performed by the

printing machine, wherein an optical detection device (30, 31, 32) having a sensor (30, 31) directed toward a surface of a printing substrate printed in the printing machine detects the quality of the printing on the printing substrate transported through the printing machine, and wherein a control device (33, 42) that receives data from the optical detection device (30, 31, 32) uses the correcting element (40) to adjust the at least one machine element (12, 41, 43) based upon a difference (page 1, lines 123-125) between a quality of the printing that is preset as the target value and the quality of the printing detected by the optical detection device (30, 31, 32) as the actual value, in a manner that serves to minimize the difference between the target value and the actual value, wherein the optical detection device (30, 31, 32) detects simultaneously two marks or measurement fields, arranged crosswise to the direction of transport of the printing substrate and incongruent in terms of a spacing or at least in their respective positions, **wherein**, when a difference has been identified between the target value and the actual value, the control device (33, 42) determines a change in the spacing between the two marks or measurement fields arranged crosswise to the direction of transport of the printing substrate (page 2, lines 10-12), wherein, based upon (page 1, lines 32-34) the determined change in this spacing, the control device (33, 42) uses the correcting element to adjust the at least one machine element (12, 41, 43) (page 2, lines 88-91), wherein additional machine elements (41, 43), each of which can be adjusted using a correcting element (40), are provided (known), wherein the correcting elements (40) for different machine elements (41, 43) can be adjusted independently of one another (known) by the control device (33, 42), wherein the adjustment of the different machine elements (12, 41, 43) counteracts interfering factors having different causes and different temporal behavior or different surface effects on the printing, wherein, in the case of a difference (page 1, lines 123-125) between the target value and the actual value, the control device (33, 42) analyzes (page 2, lines 1-3) the data from the optical detection device (30, 31, 32) with respect to the interfering factor causing the difference, its temporal behavior (implicit) and/or its surface effect on the printing, and initiates the control operations necessary to achieve the quality of the printing to be achieved from the analysis (page 2, lines 6-12) of the same data provided by the optical detection device (30, 31, 32), wherein the control operations act upon different machine elements (12, 41, 43) (page 2, lines 6-8, 45).

- 1.3 The object of claim 1 thus differs from the known printing machine in that the optical detection device (30, 31, 32) simultaneously detects the two marks or measurement fields, which are both assigned **to the same color segment**.
- 1.4 The object to be attained with the present invention can thus be viewed as improving the ink control, i.e. the color register precision.
- 1.5 The solution proposed in claim 1 of the present application cannot be viewed as inventive for the following reasons (Article 33(3) PCT):
Although Document D15 describes sensors only for the purpose of register precision, to one of ordinary skill in the art it is obvious that the detection device from D15 could comprise the same sensors or different sensors for color register precision.
One of ordinary skill in the art would thus view the incorporation of the characterizing feature "color patch" into the printing machine described in D15 as a constructive measure for attaining the stated object.

2 DEPENDENT CLAIMS 2-15

- 2.1 The dependent claims 2-15 appear to contain no additional characterizing features that, in combination with the characterizing features of any one claim upon which the

listed claims are based, could result in an object that is based upon an inventive step. All of these characterizing features are known in the art or are a part of the prior art and have already been used for the same purpose (see the corresponding citations from the International Search Report). Furthermore, these characterizing features relate only to structural embodiments that attain independent objects, without their combination resulting in any surprising effects.

2.2 The additional reasons for this are as follows:

- With respect to the characterizing feature "temperature-control device" Document D1 describes the same advantages (improving ink control) as the present application does. Thus one of ordinary skill in the art would view the incorporation of this characterizing feature into the printing machine described in D15 as a constructive measure for attaining the stated object - **[Claim 2]**
- It is generally known to one of ordinary skill in the art to use a detection device to continuously detect marks or measurement fields in the printing, so that a control device can diminish register error, especially inking register error, using a servo drive - **[Claim 3]** - see, for example, D2, D4, D6, D7, D10-D12.
- The characterizing feature "data bus" is already known to one of ordinary skill in the art - **[Claim 4]** - see, for example D15, page 3, lines 9-11; D21, column 4, lines 33-35; D23, column 6, lines 5-9.
- The characterizing features "control device", "correcting element", "guide element", "detection device" and "centering" from **Claims 5, 7, or 6** are not novel or are not based upon an inventive step.
- The characterizing feature "to a common, coordinated, synergistic reaction" is obvious to one of ordinary skill in the art, as such a person would recognize the cost of multiple control devices, each assigned to one correcting element, as a significant disadvantage, and as a result would use a single control device in a printing machine - **[Claim 8]**
- The detection of an interference in the production implemented with the printing machine, especially a paper web tear, is an already known characterizing feature, and its obvious result is a shutdown of production - **[Claims 9-13]**
- The characterizing feature "switch for changing the transport pathway of the printing substrate" is already known - **[Claims 14-15]** - see, for example, D22, abstract, paragraph [0005]

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Description

Printing Machine Having at Least one Machine Element That Can Be Adjusted By a Setting Element

The invention relates to a printing machine having at least one machine element that can be adjusted using a correcting element, in accordance with the preamble to claim 1.

From EP 0 763 426 B1 and from DE 195 33 822 A1, which establishes the priority of the former publication, a method for controlling inking in printing with a printing machine, especially a sheet-fed offset printing machine comprising multiple printing couples, is known, in which, for example, an imaging device is used to obtain actual colormetric values for a multitude of selected measuring points distributed over the entire surface of an image substrate, and these are stored as reference values for at least one subsequent printing, wherein in the subsequent printing actual values are obtained at measuring points that coincide with the previously selected measuring points, wherein the inking in the print run is controlled only at those measuring points that change the most, by means of correcting elements that act upon said measuring points. Elements for correcting the coating thickness of the printing ink, for correcting the quantity of dampening agent, and for correcting the register, all of which are active in zones, are listed as correcting elements. A control unit that controls the respective correcting elements and an imaging device that scans the entire printed surface of a sheet are provided. Inputs into a data processing unit that is connected to the control unit can be accomplished via a keyboard.

From EP 0 598 490 A1 a color register system for a printing machine is known, wherein a computer uses a camera or a group of cameras to detect any misalignment of colors in a printed image by comparing a relevant image with a stored reference image, and uses a print controller to align a longitudinal, transverse, and rotational position of cylinders in the printing machine relative to a

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following a change in the setting of one or more machine elements. This approach results in a complex control system for the printing machine, in which the quality of the printing is viewed as a controlled process that inhibits interfering factors and must be regulated.

The object of the invention is to create a printing machine having at least one machine element that can be adjusted with a correcting element, wherein a quality of the printing can be adjusted and will be stable at the adjusted level in the print run.

The object is attained according to the invention with the characterizing features of claim 1.

The benefits that can be achieved with the invention consist especially in that a quality of the printing can be adjusted and can be maintained at the adjusted level in the print run. An interfering factor that negatively influences the quality of the printing is effectively counteracted in a synchronized manner, viewed with other interfering factors, as soon as the detection device detects the negative effect of the interfering factor on the quality of the printing. This is possible because the detection device is capable of detecting all interfering factors that affect the quality of the printing. A simultaneous detection of all interfering factors, both in real time and near the location at which the quality of the printing is produced, enables a rapidly effective control from an evaluation of the output signal from only one detection device, so that with respect to the printing, a stable operating state producing good quality can be achieved after only a very short time. The detection of the quality of the printing in its entirety, combined with an evaluation of the data that correlate with it with respect to multiple, preferably all, interfering factors that adversely affect the quality of the printing, means a substantial reduction of work for an operator operating the printing machine, as he/she is not required to monitor and/or operate a multitude of different control and/or regulating devices.

Claims

1. Printing machine having at least one machine element (08) that can be adjusted with a correcting element (07), wherein an adjustment of the at least one machine element (08) affects a quality of a printing performed by the printing machine, wherein an optical detection device (11) having a sensor that is directed toward a surface of a printing substrate printed in the printing machine detects the quality of the printing on the printing substrate transported through the printing machine, and wherein a control device (12) that receives data from the optical detection device (11) uses the correcting element (07) to adjust the at least one machine element (08) based upon a difference between a quality of the printing that is preset as the target value and the quality of the printing that is detected by the optical detection device (11) as the actual value, in a manner that serves to minimize the difference between the target value and the actual value, wherein the optical detection device (11) simultaneously detects two marks or measurement fields, which are arranged crosswise to the direction of transport of the printing substrate and are incongruent in a spacing or at least in their respective positions, characterized in that the optical detection device (11) detects the two marks or measurement fields, both of which are assigned to the same color patch, simultaneously, wherein, when a difference is identified between the target value and the actual value, the control device (12) implements a change in the spacing between the two marks or measurement fields, crosswise to the direction of transport of the printing substrate, wherein the control device (12) uses the correcting element (07) to adjust the at least one machine element (08) based upon the identified change in said spacing, wherein additional machine elements (08), each of which can be adjusted using a correcting element (07), are provided, wherein the correcting elements (07) of different machine elements (08) can be adjusted independently of one another by the control device (12), wherein the adjustment of

the different machine elements (08) serves to counteract interfering factors having different causes and different temporal behavior or different surface effects on the printing, wherein, when a difference between the target value and the actual value exists, the control device (12) analyzes the data from the optical detection device (11) with respect to the interfering factor causing the difference, its temporal behavior and/or its surface effect on the printing, and initiates the control operations necessary to achieve the quality of the printing to be produced, from the analysis of the same data provided by the optical detection device (11), wherein said control operations act upon different machine elements (08).

2. Printing machine according to claim 1, characterized in that at least one machine element (08) is a temperature-control device for controlling the temperature of at least a part of a circumferential surface of a rotational body of the printing machine, wherein said rotational body is involved in the transport of a printing ink to the printing substrate being printed with said ink in the printing machine.
3. Printing machine according to claim 1, characterized in that the control device (12) implements the process of adjusting the at least one machine element (08) continuously during the printing.
4. Printing machine according to claim 1, characterized in that at least the optical detection device (11), the control device (12) and the correcting element (07) are connected to one common data bus.
5. Printing machine according to claim 1, characterized in that the control device (12) controls at least one guide element arranged in the printing machine for guiding the printing substrate during its transport through the printing machine, or regulates said guide element via a correcting element (07), based upon the data

- provided by the optical detection device (11).
6. Printing machine according to claim 5, characterized in that the control device (12) regulates the guide element via a correcting element (07) for the centering of the printing substrate.
 7. Printing machine according to claim 1, characterized in that at least one machine element (08) that acts upon the mechanical technology and at least one machine element that acts upon the properties of the material being used in the printing, especially the ink, are both provided, wherein, in the event of a difference between the target value and the actual value, the control device (12) utilizes the differently acting machine elements (08) based upon the necessity determined from the data collected by the optical detection device (11).
 8. Printing machine according to claim 1, characterized in that, in the event of a difference between the target value and the actual value, the control device (12) induces multiple correcting elements (07) and/or machine elements (08) to a joint, coordinated, synergetic reaction on the interfering factor causing the difference.
 9. Printing machine according to claim 1, characterized in that the control device (12) evaluates different interfering factors identified from the data from the optical detection device (11) in parallel process branches.
 10. Printing machine according to claim 1, characterized in that, when a paper web break

is identified, the control device (12) uses a signal (s) to control a web intercept device, based upon the data provided by the optical detection device (11).

11. Printing machine according to claim 1, characterized in that, when a paper web break is identified, the control device (12) uses a signal (s) to control a web severing device, based upon the data provided by the optical detection device (11).
12. Printing machine according to claim 1, characterized in that, when a serious interference in the production being implemented with the printing machine is identified, the control device (12) shuts down the printing machine based upon the data provided by the optical detection device (11).
13. Printing machine according to claim 12, characterized in that the serious interference is a tear in the printing substrate.
14. Printing machine according to claim 1, characterized in that the control device (12) controls a switch for changing the transport pathway of the printing substrate based upon the data provided by the optical detection device (11).
15. Printing machine according to Claim 14, characterized in that the switch feeds a printed product identified by the control device (12) to be of good quality to a first delivery and a printed product identified to be of poor quality to a second delivery.